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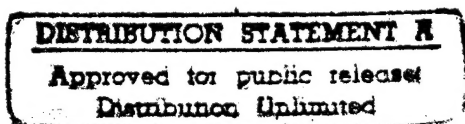
**FORCE XXI AND SEA DRAGON - ISSUES FOR
THE OPERATIONAL COMMANDER**

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Joint Military Operations course of study.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.



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15. Abstract: The United States Army and United States Marine Corps are both in the process of developing two futuristic command systems. Force XXI is the system that the U. S. Army is developing to fight and win the wars of the next century. The U. S. Marine Corps is developing the vision called Sea Dragon to be the basis of their futuristic warfighting command system.

This piece will address the two command systems in the context of command and control and how it influences the commander's selection of tactical employment and unit organization to accomplish the mission.

There are similarities and differences between Force XXI and Sea Dragon. Both exploit the Information Age's technologies to accomplish the mission. Both predict smaller force structures due to the enhanced technology. There are processes and organizations that will monitor the technical interoperability challenges of the two systems. The main differences are within the type of command and tactics that each will employ. With training and exchange of liaison officers, these differences could become a force multiplier for the operational commander.

Two implicit assumptions are made in the development of these systems. First, that the U.S. military will maintain dominant technological superiority over its adversaries. The second assumption is that the U.S. will dominate the electro-magnetic spectrum. By negating these two assumptions, the premise that smaller forces using new technology to achieve the same or greater results as past large conventional forces is not longer valid. The operational commander must be aware of the risk entailed by smaller, reorganized force structures based on the assumption of technological superiority. If he does not agree with that assumption, he must weigh in with the Chairman of the Joint Chiefs and two Service Chiefs for resolution.

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FORCE XXI AND SEA DRAGON - ISSUES FOR THE OPERATIONAL COMMANDER

The United States Army and United States Marine Corps are both in the process of developing two futuristic command systems. Force XXI is the system that the U. S. Army is developing to fight and win the wars of the next century. The U. S. Marine Corps is developing the vision called Sea Dragon to be the basis of their futuristic warfighting command system. This monograph will examine both futuristic systems based on command theory. Then, comparisons will be made between the two systems. Lastly and most importantly, this piece will address the issues of the operational commander if he is employing both the Army and Marine Corps as two elements of a ground component that will be using these two futuristic systems.

Command Issues. The art and science of command and control have always been a factor in warfare. The way the commander decides to command influences the tactics it employs and how his unit is organized. This piece will address the two command systems in the context of command and control and how they influence the commander's selection of tactical employment and unit organization to accomplish the mission.

Van Creveld's, Command in War, provides historical examples of command methodologies employed over thousands of years and why tactics and organization must be discussed in concert with command and control. Twenty-five hundred years ago, the Greek armies formed phalanxes that were made up of ten thousand soldiers -- eight deep and three quarters of a mile long. Tactics were extremely limited due to the tight compression of the formation and the lack of a way to communicate the commander's intent. Before battle a

reconnaissance was made and a pre-battle meeting among the commanders was held to form a plan. After both forces were positioned, an acoustic signal was given to commence battle. Since the commander had no means to influence his forces due to almost nonexistent means of communications, he would join in the battle. The first clash of forces invariably decided the outcome. As a result of this, the use of reserves was nonexistent.¹

Early in the fourth century B.C., the Greeks started to outflank their opponents. The commander influenced the flanking movement by positioning himself at the head of the right flank. Because of his positioning and lack of communications, he could not control the entire army and particularly sacrificed his left flank. It was not unusual for the commander to have thought that his army was the victor and began to celebrate, while his left flank was being decimated.²

Later cavalry and elephants were introduced which further exasperated the dilemma of where the commander should position himself. The intuitive commanders placed themselves at the perceived decisive point. But due to lack of adequate communications, again it was at the expense of the rest of the army.³

Over the years, communication advances assisted the commanders in transmitting his commands and synchronizing the activities of his forces. Electronic means such as the telegraph, telephone and the radio all had an impact on how the commander could command and control, tactically employ his forces in battle, and organize for battle. During the late 1800s, the telegraph

¹ Martin Van Crevald, Command in War, (Cambridge, MA: Harvard University Press 1985) p 41-42.

² Ibid., p 43.

³ Ibid.

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provided the operational commander with a way to direct strategic and operational maneuvering. In World War I, the telephone dramatically enhanced the capability to call artillery fire support. During World War II, the radio provided the tool to coordinate the maneuver activities of ground, armor and air support⁴. Today, modern technological advances including high speed electronic data and video transmissions can provide the commander near real time information of the battlefield. Yet, the commander's dilemma continues, what is the best method to command and control the forces? Can technology assist in this process or can the commander become a slave to technology in his endless quest to control the forces? What is the optimal doctrinal tactics and organizational structure to achieve success?

Joint Publication 3-0 provides the following definition for command and control:

Command and control (C2) is the exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of a mission ... Command at all levels is the art of motivating and directing people and organization into action to accomplish missions ... To control is to regulate forces and function to execute the commander's intent.⁵

Inherent within this definition is the reoccurring dilemma that past commanders have and future commanders will face. To command, a commander's presence must be felt for him to motivate his subordinates to accomplish the mission. To control, a commander must be in position to view the battlefield and transmit his intent to the entire force. Modern technology may enhance control, but not necessarily enhance command. Additionally, "right sizing" initiatives driven by the post cold war environment and budgetary realities, has led the U.S. services to radically restructure

⁴ Headquarters, U.S. Army Training and Doctrine Command, Force XXI Operations TRADOC Pamphlet 525-5 (Ft. Monroe, VA: TRADOC 1 Aug 1994) p 1-5.

⁵ Joint Chiefs of Staff, Doctrine for Joint Operations Joint Pub 3-0, 1 February 1995, p II-16 & II-17.

their forces. As an example, the U.S. Army has inactivated eight divisions and one Corps during the 1990s.⁶

Professor Czerwinski, of the National Defense University, has written an article addressing the point that the U. S. military is embarking in three different approaches to command and control.⁷ First, he addresses command by direction and states that the U.S. Army's futuristic Force XXI is an example of that approach. Secondly, he states that command by influence was the style of command employed by the Germans in the later stages of World War I and most of World War II. Lastly, he discerns that the Joint Chief of Staff's, "System of Systems," is an example of command by planning. Command by planning will not be discussed in this analysis. Professor Czerwinski cogently points that, "American command practice is at a crossroad."⁸

Force XXI. Force XXI is a dramatic change from the current Army doctrine of AirLand battle and how the Army is currently trained and organized. General Sullivan, the former Army Chief of Staff, states within TRADOC Pamphlet 525-5, Force XXI Operations:

More importantly, this is a work that tells us about how the entire Army must change -- from the foxhole to the factory -- top to bottom ... We can not fight the way that 525-5 envisions without changing how we organize, train, mobilize, project and sustain the force.⁹

Force XXI is focused on technological advances that will continue to emerge during the Information Age. TRADOC Pamphlet 525-5 makes the assumption that, "Information

⁶ Gordon R. Sullivan, Gen. U.S. Army, "Building the Force for the 21st Century -- Force XXI," no date, available online: <http://204.7.227.67/lamhome/mission/mission.html/>.

⁷ Thomas J. Czerwinski, "Command and Control at the Crossroad," Marine Corps Gazette, October 1995, p 13-15.

⁸ Ibid., p 13.

⁹ Headquarters, U.S. Army TRADOC, Force XXI Operations, p forward.

technology is expected to make a thousandfold advance over the next 20 years."¹⁰ Force XXI's goal is to exploit U.S. technology's quantum competitive advantage provided from quantity, quality and usability of information. "Force XXI must be organized around information -- the creation and sharing of knowledge followed by unified action base on that knowledge which will allow commanders to apply power effectively."¹¹

Conceptually, Force XXI is based on five characteristics: doctrinal flexibility, strategic mobility, tailorability and modularity, joint and multinational connectivity and the versatility to function in war and operations other than war (OOTW).¹² These characteristics provide the conceptual framework for Force XXI development, training and sustainment.

Six patterns of operations will be simultaneously conducted by Force XXI. Protecting the force, projecting the force and sustaining the force to transit to other operations will not significantly change from today's processes. With the use of technological advances, Force XXI will gain information dominance, shape the battlespace and conduct decisive operations which will require radical change from present warfare. Information dominance will be achieved by linking sensors throughout the three levels of war (tactical, operational and strategic), to provide near real time situational awareness requiring world-wide communications connectivity. The battlespace will be shaped by using joint extended-range systems, ground maneuver, and deception and psychological operations. The battlespace is defined by speed, space and time. By gaining informational dominance and shaping the battlespace to its advantage, the Force XXI

¹⁰ Ibid., p 1-5.

¹¹ Sullivan, "Building the Force for the 21st Century--Force XXI," p 2.

¹² Force XXI Operations, p 3-1 thru 3-3.

forces will be able to conduct decisive operations.¹³ Decisive operations will be accomplished by achieving and sustaining high tempo of operations, overwhelming lethality and superior survivability.¹⁴

General Hartzog, present commander of TRADOC, states that there are three requirements necessary to encapsulate the full potential of Force XXI. First, joint and coalition interoperability are necessary. Second, training is required to ensure the soldier exploits the full potential of the technology. Last, the Army must change its combat development process, or how it develops, equips, and maintains the force. General Hartzog states: "Army XXI will not consist of "push-button" or cyber warriors. If anything, the amount of information available will magnify the importance of soldiers in the loop and their judgment."¹⁵

There are three anticipated changes that will result from the implementation of Force XXI -- battle command (command and control), organization, and operations. It must be emphasized that these are anticipated changes that will be validated as Force XXI develops.

Battle command is defined within TRADOC Publication 525-5 as the "art of decision-making, leading, and motivating informed soldiers and their organizations into action to accomplish the missions at least cost to the soldiers."¹⁶ Battle command is the new Army term to define command and control that takes advantage of the quantum improvements in technology provided by the Information Age. "Direction of a unit combines command, leadership,

¹³ Willian W. Hartzog, Gen. U.S. Army, and Susan Canedy, "Synergy for the Next Century," Army, May 1996, p 21-22.

¹⁴ Sullivan, "Building the Force for the 21st Century--Force XXI," p 2.

¹⁵ Hartzog and Canedy, p 22.

¹⁶ Force XXI Operations, p 3-3 & 3-4.

management and teaching."¹⁷ Smaller staffs sharing enhanced situational awareness will enable concurrent planning and execution. A climate of trust, mutual understanding and teamwork will be positive benefits. State of the art technology and the designed procedures will achieve more efficient and effective staff work to provide the commander optimum courses of action based on near real time battlefield awareness. Force XXI is to give the commander additional flexibility to react to change and overcome ambiguity. Improved situational awareness should allow the commander to operate at a higher tempo of operations and multidimensional battlespace than the enemy. Confusing the enemy and bringing clarity to the friendly force commander is an ultimate goal of Force XXI's battle command.¹⁸

The division will remain as the main warfighting battlefield unit, but the division will look different. The specifics of organizational changes will evolve. Target destruction will be enhanced by laser rangefinders, UAVs, and GPS-fused precision weaponry. Information may not only make targeting more effective, but more efficient. This efficiency may translate to fewer trucks, ships, supply points, etc. Therefore, with efficiency there may be less of a sustainment overhead. The logistic footprint will be reduced, resulting in a higher tooth to tail ratio.¹⁹

It is envisioned that Force XXI will be able to provide enhanced theater-strategic operations. A single action or several actions simultaneously may bring tactical, operational and strategic immobilizing damage to the enemy. Previously, deep strike was conducted without near

¹⁷ James E. Sikes, LTC U.S. Army, "Battle Command and Beyond: Leading at the Speed of Change in the 21st Century," March 29, 1995, available online: <http://204.7.227.67/forcearticles/battle/battle11.html/>, p 4.

¹⁸ Ibid, p 6.

¹⁹ Gordon R. Sullivan, Gen U.S. Army, "Force XXI - - America's 21st Century Army", Jun 2 1995, available online: <http://204.7.227.67/force21/jv/jv-essay/fxxi3.html/>, p 4.

real time visual observation. In part, this necessitated the employment of combat power in sequence. Deep strikes normally preceded the main attack. Force XXI sensing, controlling and weaponry enhancements will be able to see the enemy in deep battle in near real time and provide increased volume and precision with greater efficiency and effectiveness. This capability will allow the decisive, simultaneous attack throughout the depth and breath of the theater. The enemy will have less time to react. These improvements to sense, control and strike with increased accuracy and lethality will provide the potential for simultaneous action. Simultaneity of overwhelming combat power using all resources available -- tactical, operational and strategic -- to achieve a paralyzing blow to the enemy.²⁰

The U.S. Army has a Force XXI Campaign Plan, using the standard five paragraph order format, to execute the development, evaluation, equipping, and sustainment of Force XXI.²¹ Battle laboratories are a means to identify requirements for new doctrine, training, leader development, organization and materiel. Advanced Warfighting Experiments (AWE) provide a realistic way to test component parts of Force XXI. Exercise Forces (ExFor) will be refined based on the lessons of the Advanced Warfighting Experiments. The 4th Infantry Division (Mechanized) at Ft. Hood, Texas has been assigned as the Exercise Force that will incorporate Force XXI battle command, unit and staff organization, doctrine, and tactics. A series of exercises have been planned to evaluate and refine Force XXI concepts.²²

²⁰ Gordon R. Sullivan, Gen U.S. Army & Anthony M. Coroalles, LTC U.S. Army, "The Army in the Information Age," March 31, 1995, available online: <http://204.7.227.67/force21/articles/sull2-2.html/>, p 1-3.

²¹ Headquarters, U.S. Army, "Force XXI Campaign Plan," no date, available online: <http://204.7.227.67/f21camp.html/>, p 1-9.

²² William W. Hartzog, Gen U.S. Army, "On the Road to Force XXI," no date, available online: <http://204.7.227.67/force21/jv/jv-essay/roadfxxi.html/>, p 1-4.

Sea Dragon. In 1995, the Commandant of the Marine Corps created the Commandant's Warfighting Laboratory (CWL) and stated its mission as:

to serve as the cradle and test bed for the development of enhanced operational concepts, tactics, techniques, procedures, and doctrine which will be progressively introduced into the FMF (Fleet Marine Force) in concert with new technologies.²³

Sea Dragon is the U.S. Marine Corps vision to embrace change and exploit the advantages of technological advances. Sea Dragon will implement new operational concepts to support U.S. Marine Corps and Naval Expeditionary Force requirements and objectives of the 21st century. Enhanced "operational maneuver from the sea" will result in the employment of technological advances that support the Naval Services doctrine of "Forward... from the Sea".²⁴

Sea Dragon will not change the U.S. Marine Corps' current warfighting doctrine. Colonel Roques, Deputy Director of the CWL, stated that Sea Dragon will be an enhanced enabler to the present warfighting doctrine of maneuver warfare.²⁵

In FMFM 1, Warfighting, when describing maneuver warfare, comments that war's nature contains friction, uncertainty, fluidity and disorder. The human dimension of war is that it is violent and dangerous. Rather than meet a problem head on, circumvent the enemy and apply strength to the enemy's weakness. Combat power, concentration, speed, surprise and boldness are attributes emphasized. Command is decentralized through implicit communications using mission type orders and an understanding of the next senior commander's intent. The critical

²³ Mark Sutherland, Major USMC, "Why Sea Dragon," Proceedings, May 1996, p 99.

²⁴ Commandant's Warfighting Lab, "CWL Technology Exploration & Exploitation Plan", no date, available online: <http://138.156.204.100/www/cwl/planch1.html/>, p 1.

²⁵ Telephone conversation with Col Paul Roques, USMC, Deputy Director of CWL, Quantico VA: 25 Apr 1996.

decision of a commander is where to focus the effort of the powerful combined arms team under his command.²⁶ Coup d'oeil describes the commander's intuition to fully understand his superior's intent and the ability to expertly decide his optimal location to influence the battle. Coup d'oeil is developed by constant exposure to combat situations and experience with his superiors that develops trust and confidence to make the rapid decision.²⁷

Sea Dragon's tenets lie in dispersed, independent and coordinated units ashore supported with remote and timely firepower and logistics afloat. This will result in a more adaptive, effective and less vulnerable warfighting force.²⁸

There are four fundamental Naval Expeditionary Force operations changes that are anticipated inherent within the tenants of Sea Dragon - dispersed independent small forces, sea-based and air precision fire, sea-based support and logistics, and increased mobility. Dispersed and independent small forces will be able to operate over a much larger area of operations against enemy forces, targets or facilities. The ground forces will provide a reduced footprint ashore that will be supported by advanced sensors and lightweight, portable command and control systems providing near real time situational awareness. Sea-based guns and missiles complemented by enhanced combat air power will provide timely and lethal attack against targets. This will result in less need for shore-based fire support and associated logistics that that entails. Enhanced sea-base logistics will result in a smaller presence ashore, be more cost effective, and

²⁶ U.S. Marine Corps, Warfighting FMFM 1, (Washington D.C.: 6 March 1989), p 63-65.

²⁷ James J. Tritten, Cdr USN (Ret), "Intuitive Combat Decisionmaking," Marine Corps Gazette, April 1996, p 29 -31.

²⁸ "CWL Technology Exploration & Exploitation Plan," p 2-3.

pose less risk. A smaller foot print ashore for fire support and logistics will result in increased mobility and decreased detectability ashore.²⁹

"Long poles in the tent" are defined as functional areas that require focused, substantive change or improvement. There are six areas identified as "long poles" in the Sea Dragon tent - command and coordination; fire and targeting; mobility and maneuver; survivability and sustainment; training and education; and manpower. These long poles in the Sea Dragon tent are essentially a checklist of areas that require capability improvement to achieve the envisioned Sea Dragon operational concept.³⁰

The Marine Corps, like the Army, has a schedule to test and evaluate Sea Dragon concepts. Of note, Fleet Marine Force units will be used to create a Special Purpose Marine Air-Ground Task Force (SPMAGTF [X]) which will be given colors in December 1996 to test and evaluate Sea Dragon experiments and exercises. In June 1997, a larger MAGTF, MEF Forward, will test and evaluate Sea Dragon. During 1998, an enhanced Marine Expeditionary Unit is scheduled to deploy as part of an Amphibious Readiness Group (ARG) with validated Sea Dragon capabilities.³¹

Operational Commander Issue -- Command and Control. The services have the responsibility to recruit, train, maintain and equip their forces for unified commander employment.

²⁹ Ibid., p 2.

³⁰ Commandant's Warfighting Lab, "Long Poles in the Sea Dragon Tent", no date, available online: <http://138.156.204.100/www/cwl/cwlpls.htm/>, p 1.

³¹ Commandant's Warfighting Lab, "CWL Calendars/Key Events," no date, available online: <http://138.156.204.100/www/cwlcal.htm/>, p 1.

The operational commander should be concerned with several areas of Force XXI and Sea Dragon - command and control, tactics, and organization.

As previously mentioned, Professor Czerwinski deducted that Force XXI is a form of command by direction. He states that command by direction is the oldest method of command and has been used almost exclusively since mid-1700. This monograph has stated several examples of the commander's quest of proper positioning to direct his forces. The technologies of the Information Age are purported solve the commander's dilemma. Force XXI may become guilty of violating Van Crevald's first "iron rule" of improving performance of command.

Confronted with a task and having less information than is needed to perform the task, [a military] organization may . . . increase its information-processing capability . . . [which] will lead to the multiplication of communications channels and to an increase in the size and complexity of the central directing organ . . . that this approach is inadequate and stand(s) in danger of being self-defeating.³²

Sea Dragon's concepts are an enabler of maneuver warfare. Maneuver warfare is an example of command by influence. Minimum guidance and information are required to command by influence. Mission type orders provide the intuitive and experienced commander the required direction in an environment of chaos and insufficient information. Van Crevald's third rule of improvement of command is:

organization may react by designing the organization, or indeed the task itself, to operate on the basis of less information, relying on the division of task into various parts and to the establishment of forces capable of dealing with each of the parts separately on a semi-independent basis. It is a central theme . . . through every change . . . [and] technological development that the third one will remain superior . . . in virtually every case.³³

Van Crevald would caution the operational commander that the ground commanders' over reliance on technology to achieve command and control challenges may be self-defeating.

Organization, tactical doctrine and training are better choices.

³² Van Crevelde, p 269.

³³ Van Crevelde, p 269.

Besides the type of command used, interoperability between the two systems should be an operational commander's concern. Within the documentation of Force XXI and Sea Dragon, the capability to conduct joint operations is noted. After years of developing incompatible stove-piped systems, the military has development and acquisition processes in place. Organizations, such as the Joint Interoperability and Engineering Organization (JIEO), will ensure technical interoperability issues are addressed. Interface standards, software protocols and system architectures are staffed and validated by the Joint Staff and approved by the Assistant Secretary of Defense.³⁴

Marines have field grade liaison officers stationed at five Army posts to monitor and provide input to the development of Force XXI.³⁵ These liaison officers will be able to identify procedural differences as Force XXI and Sea Dragon are being developed and tested. Additionally, joint exercises employing both Force XXI and Sea Dragon, such as one planned in February 1997, will identify interoperability issues.³⁶

Operational Commander Issue -- Tactics. Tactics employed with the use of the systems should be a concern of the operational commander. The U.S. Army and U.S. Marine Corps have had several differences of opinion concerning the tactics chosen and executed to accomplish a mission. In 1944 at Saipan, LtGen Hollard M. Smith, USMC, the Amphibious Corps Commander, relieved MG Ralph Smith, U.S. Army, of his 27th Infantry Division (Army) due to perceived inactivity of his unit during the invasion. This caused an emotional crisis among the

³⁴ Joint Chiefs of Staff, Joint Tactical Communications System Management Joint Pub 6-05.1, 24 April 1992, p I-3.

³⁵ Commandant's Warfighting Lab, "CWL Battle Lab Liaison Officers," no date, available online: <http://138.156.204.100/www/cwl/battle.htm/>, p 1.

³⁶ Sutherland, p 100.

services. The U.S. Army's Buckner Investigation revealed that tactical differences were an element in the misunderstanding. LTC Henry Ross, the Assistant G-3 of the 27th Division, stated:

One sure way of getting washed out of command and General Staff College was to split a hill mass in half. This is exactly what the Marine order called for ... That is ridiculous but that was the way it was.³⁷

More recently during the Persian Gulf War, the U.S. Marines without hesitation breached the Iraqi minefields and quickly headed toward Kuwait ahead of U.S. Central Command and Army planners' predictions. General Schwarzkopf, the Commander in Chief, directed that the U.S. Army's left hook be executed early to exploit the Marines unanticipated success. The Army claimed that the Marines should have delayed since they (the Marines) were only a supporting base for the main attack, the left hook (the Army). This allowed the Iraqi Republican Guard to escape deep into Iraq.³⁸ Fortunately for all concerned, General Schwarzkopf, as the CINC, was an Army officer who made the decision to accelerate the Army's attack.

There has been considerable discussion within recent Naval Institute Proceedings magazine articles concerning the merits of maneuver warfare. Lieutenant General Cushman, U.S. Army (Retired) is a strong advocate of maneuver warfare. In fact, he advocates the expansion of maneuver warfare to become joint doctrine. He stated that although MG Peay's (now General Peay, CINCCENT) 101st Airborne Division (Air Assault) probably didn't study the USMC Warfighting, his division's superb performance was a result of it applying maneuver warfare

³⁷ Harry A. Gailey, Howlin' Mad vs the Army, (Presidio Press: Novato, CA 1986) p. 158-159.

³⁸ Michael R. Gordon and Bernard E. Trainor, LtGen USMC (Ret), The General's War, (Little, Brown and Company: Boston 1995) p 289-308, 375-432, & 471-473

tenants during Desert Storm in February 1991.³⁹ Conversely, MG Edward B. Atkeson, U.S. Army (Retired) believes that maneuver warfare belittles the attributes of firepower.⁴⁰ The publication of Fire Support in Marine Air-Ground Task Force Operations, FMFM 2-7, and Techniques and Procedures for Fire Support Coordination, FMFM 6-18, after Warfighting tend to support the point that the USMC has not abandoned fire power. "Fire support in maneuver warfare is applied through combined arms. Combined Arms is the tactics, techniques, and procedures employed by a force to integrate fire power and mobility to produce a desired effect upon the enemy."⁴¹

Force XXI tends to emphasize land based precision fires augmented with air support. Maneuver is considered secondary. Sea Dragon emphasizes maneuver supported with sea-based fires and air support.

These tactical differences are evident in the documentation outlining Force XXI and Sea Dragon. But are tactical differences between the Army and Marines important to the operational commander? Couldn't the synergistic effect of two friendly ground forces using different tactics in different sectors of the battlefield cause monumental problems for the enemy? The knowledgeable operational commander could exploit these tactical differences and use them to his advantage. First, awareness of the tactical differences is important. This awareness must be taught at service schools. Knowledgeable and operationally competent liaison officers should be

³⁹ John H. Cushman, LTG U.S. Army (Ret), "'Maneuver Warfare' Must Be Joint Warfare", Proceedings, November 1995, p 8-10.

⁴⁰ Edward B. Atkeson, MG U.S. Army (Ret), "Maneuvering Past Maneuver Warfare", Proceedings, January 1996, p 33-35.

⁴¹ U.S. Marine Corps, Fire Support in Marine Air-Ground Task Force Operations FMFM 2-7, (Washington D.C.: 26 September 1991), p 1-2.

dispatched to each service command post location to assist the sister service in understanding and coordinating their activities. Just as important, liaison officers at the joint headquarters are required to explain to the operational commander and his planners the capabilities, limitations and tactics that each service brings to the theater.

Operational Commander Issue -- Organization. The operational commander should monitor the developing organizational structures that will result from Force XXI and Sea Dragon. The issue of organization has the greatest potential impact on the operational commander. Both command systems state that smaller forces will be required to fight and win the wars of the 21st century. Two implicit assumptions are made in the development of these systems. First, that the U.S. military will maintain dominant technological superiority over its adversaries. This is a bold assumption. Technology is easily copied and transferred. Since U.S. companies manufacture few communications and automated data processing equipment using exclusively U.S. parts, it is conceivable that other nations will be able to put the parts together or at least exploit the vulnerabilities of vital components. The second assumption is that the U.S. will dominate the electro-magnetic spectrum. Until now, the U.S. has not faced an opponent that has developed the means to exploit that potential U.S. vulnerability. Yet this does not mean the U.S. will continue to solely dominate the electro-magnetic spectrum. By negating those two assumptions, the premise that smaller forces using new technology to achieve the same or greater results as past large conventional forces is no longer valid. The operational commander must be aware of the risk entailed by smaller, reorganized force structures based on the assumption of technological superiority.

The following chart encapsulates the salient points of Force XXI and Sea Dragon:

Issues	Force XXI	Sea Dragon
Command & Control	Command by direction	Command by influence
*Joint Technical Interoperability	JIEO must ensure	JIEO must ensure
*Joint Procedural Interoperability	Joint Exercises	5 field grade liaison officers to Army; Joint Exercises
Tactics	Firepower emphasized	Maneuver focus
*Firepower	Land based with air augmentation; more lethal & precise	Sea-based with air augmentation; more lethal & precise
Organization		
*Command structure	Battle Command concept	Command and coordination concept
*Combat force size	Based around division; to be determined	Smaller & more dispersed; to be determined
*Combat Service support force size	Smaller footprint in theater	Smaller footprint ashore; more sea-based

Conclusion. The operational commander must monitor the development of the U.S. Army's Force XXI and U.S. Marine Corps' Sea Dragon. Both futuristic command systems will be a change not only in the ground component forces command and control, but tactics and organization. There are differences between the two methodologies. These differences could become a force multiplier for the operational commander causing the enemy to deal with two different methodologies on the battlefield. Awareness of the capabilities and limitations of the two systems, training and liaison officer exchanges among the operational commander and two ground forces will lessen the "fog" of employing two different systems. Smaller, restructured

ground forces may have the largest impact on the operational commander. The assumptions of technical and electro-magnetic dominance is inherent in the drive to reduce force levels. The operational commander must be willing to agree with those assumptions and be prepared to accept the risk (of combat force reductions) if the assumptions are invalid. If the operational commander is not willing to accept those assumptions, he must weigh in with the Chairman of the Joint Chief and the two Service Chiefs for resolution.

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